432 AND ABOVE EME NEWS
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CONDITION: April was a winner this year with excellent conditions and good activity for the second leg of the European World Wide (EWW) EME Contest. The combination of good weather and conditions made EWW 1296 activity rival that of the ARRL Contest. Activity definitely peaked on 10 GHz, but I think we need a separate contest for the microwave EME to truly boost the turn out on these bands. I am afraid that operation on 70 cm suffered with all the attention focused on 23 and 3 cm, but should be back to normal in May. In June there will be a 432 dxpedition to Latvia – see the LY2AAM report, and additional dxpeditions using JT44 are in the works for the summer – see DL3OCH's report.

DF4UE: John Mitrowitsch@t-online.de is QRV on 70 cm EME with 4x27 el yagis and 500 W in the shack. He is operational on both CW and JT44. When John is set up for JT44 he cannot quickly switch to CW because of the way he wired his TRX/sequence controller. During April he QSO'd K2UYH on JT44 (12/16 dB).

DL0EF: Manfred (PA3GLB/DL5FAB) <Manfred.Lugert@inter.nl.net> writes on his groups EWW Contest efforts on 3 cm -- DL0EF is the Callsign of the "Foerderverein Astropeiler Stockert", a club which refurbished the first German radio telescope built in the 1950s and practices amateur radio activities as well a amateur astronomy. DL0EF is located near the small medieval village of Bad Muenstereifel, not far from Cologne, in the hills of the Eifel. The DL0EF crew comes from the whole Germany and the Netherlands. Traveling was performed on 12 April and operation started at 1430 to 0200 on 13 April. There was no operation on Sunday afternoon. After repairing problems with the dish's synchro-drive, we thought that we were ready go. However, we also had transverter problems that we were able to repair within quickly. Only a hand-full of Eur stations were heard and worked on the 12th. Shortly before closure of our moon window, in the early morning of the 13th some NA stations appeared on the band. Our log read as follows: 12 April at 1558 OK1UWA (559/539), 2054 F6KSX (O/O), 2222 CT1DMK (449/O), 2325 F2TU (O/O) and 2339 F1BLL (O/O), and on 13 April at 0000 IK2RTI (O/M), 0118 W5LUA (O/O) and 0159 W7SZ (M/M). Heard were DL2LAC and I5PPE. We heard a number of stations, but were not always able to get our signal through to them. We are planning to increase our transmit power and activity for the next round of contests in autumn this year. The crew included DL2KA, DF3GL, DD9ZL, DH9FAH, DH9FAG and others. For more information see our web page at www.astropeiler.de.

DL3OCH: Bodo DL3OCH@t-online.de is set up for portable EME on 23 cm using JT44 and tested his system – I traveled to Monaco and was able to get in contact with DJ9YW (JO42) via 23 cm EME. I used an IC-706 and a Transverter (made by DJ9YW) with 100 W output. My antenna was a 59 el yagi. We operated in JT44. I was surprised how good the system worked. I believe this was the first QSO from 3A to DL on 23 cm via the moon. I plan to do more dxpeditions. In the past I have operated from 27 different DXCC locations. I often drive to Liechtenstein and plan to operate as HB0/DL3OCH/p in the near future. If anyone would like a JT44 EME QSO on 23 cm with HB0, please e-mail me for a sked. The minimum requirement for a QSO is about a 6 m dish and 300 W at the feed using JT44. DJ9YW <dj9yw@t-online.de> is also looking for skeds on 23 cm with JT44. Stations wishing to QSO Heinrich should have ~ 100 W at the feed, about 5 m long yagi (20 dBd) or ~ 1.8 m dish (with circular pol).

F2TU: Philippe <F2TU.Philip@guideo.fr> came close to extending the 1296 distance with his recent QSO with ZL1KA -- On 1296 on Saturday 12 April at 1317 F2TU QSO'd ZL1KA (O/O), JN38LG/RF72JV = 18,419 km. The moon window was very short ~1 hour, but reduced to 15 min by the real horizon. I had a 3 dB increased in noise by the trees. My first 23 cm QSO with ZL was with ZL3AAD on 28 May 1985 at 18,805.368 km - the World record distance to this time. My EWW EME Contest results on 432 were 41x25 with initials OZ6OL #232, SP6JLW #233, OE3JPC #234, JA2TY #235, JR9NWC #236, HB9JAW #237 and KE2N #238, on 1296 45x26 with initials ZL1KA #205, HB9JAW #206, F5VHX #207 and SM5CFS #208, 2304 13x11 with N8OU #33 and GW3XYW #34, on 5760 5x5, and on 10 GHz 8x6. I will be QRV for the Italian Contest. [Please note the change in Philippe's e-mail address.]

DL3OCH on 23 cm 3A Dxpedition using JT44

F5VHX: Graham confirms that he was operating the EWW Contest from his home despite some reports to the contrary. He was on for only one day and worked 18 stations including 2 initials (OH2AXH and K5GW). This brings him to #40. The smallest station worked was G3LQR.

F6KHM: Xavier (F5TTU) f5ttu@club-internet.fr reports on F6KHM activity during the EWW EME Contest – The first part of the contest was very good at F6KHM on 432 with a final score of 63x33. I was very disappointed to have missed a QSO with F6HZL, a new French station on the moon. He called me, but because of a procedure problem on his side, I was not able to achieve a valid QSO. Heard and missed too were VK4AFL. No technical problems, the PA is running at 3,000 W all the time and wonderful weather in Brittany, west France. I'm very happy with the new feed system, a *double* dual-dipole feed, but with the TX circular and RX H or V. It's considerably better than the previous system – a single polar rotatable feed. During the second part of the European contest (on 23 cm), I had many problems with our new TH313 final amp - burnt anode Kapton (2 times) and HV connectors (3 times). Finally, a screen supply decided to QRT after 5 explosions HI! The worst thing was an electrical failure at 2200 on Saturday during a QSO with DF4PV until moonset. On Sunday, we finished the contest only with driver TH308 at 150 W output in the shack, 80 W at the feed. During this second weekend, we were visited by F1ANH, F6CGJ and F5HRY. We also spent much time at the restaurant.

G3LQR: Simon G3LQR@aol.com was QRV on 1296 for the EWW EME Contest – I spent a little time on 1296 and QSO'd 25 stations with some more heard. The W window was bit late for me and I only worked K5JL. OH2DG and

HB9JAW were initials bring me to #82. The system kept going with about 300 W from my 4-tube 2C39ba amp. Sun noise with a 100 flux gives 15.75 dB from my 4.2 m dish. (I may try to make the dish larger). The old cowl gear motor from WW2 played up and needed a tap with a hammer at odd times. The 8 times 8.6 lambda 432 yagis are going better. I found a hairline crack in one soldered joint and am now seeing 13.5 dB of sun noise (flux 100). It's still hard to find a quiet sky with yagis, so more work is still needed. I'm afraid 9 cm is still on hold, but I will try to get it going this year. I don't think a dish will work at 6/3 cm. Progress has been poor with the Russian tubes. I'm now trying a GS15 on 23 cm, but keep coming back to the 2C39s.

G3LTF: Peter 100633.1656@compuserve.com had another GOOD month! – I had good WX and condx with pretty high activity for most of the contest. I was on 1296 most of the time with a short foray on 2 m for 4 QSOs with a quad feed in the dish. On 12 April I worked, OK1CA, K5JL, F2TU, VE6TA, K0YW, W2UHI, F6KHM, N2UO, K2UYH, K5GW, G4CCH, N7AM, W5LUA, WA6PY, OH2DG, JA6AHB, HB9JAW, HB9Q, ZS6AXT, HB9BBD, F5VHX, HA5SHF, OZ4MM, DK0ZAB, JA6CZD, DF3RU, DL1YMK, G3LQR, OZ6OL, OH2AXH, IK2MMB, HB9SV, OE9ERC, DL8OBU, SM3AKW, SM2CEW and DF4PV, then on the 13 April W7SZ, WA4NJP, DJ9YW, IK3COJ, SM5CFS and OE5EYM for a total of 44x24. This gives me a total of 105 QSOs overall on 4 bands (2, 70, 23 and 13). CWNR were VE7BBG and OZ9AAR (who was using only 7 W!). Heard were K7XQ and W9IIX. We could still spread out more, but operating manners were generally good, so it was not a big problem. I'm currently rebuilding my 10 GHz tropo system, but will soon return to the 9 cm EME project.

G4DDK: Sam jewell@btinternet.com after nearly 10 years of on/off working towards EME is nearing his goal of having a station on the air. I now have a 7.5' KTI TVRO dish with an OK1DFC septum plate feed and WD5AGO preamp in operation. I have heard my first signals on 23 cm EME during the April contest weekend. The dish is mounted on a polar mount and steered via two linear actuators. The 18 inch 'azimuth' drive limits me to a window from about 105 to 210 degrees. The declination drive allows me a full +/-28 degs. The declination readout is a Winegard 'satellite' inclinometer with 1 deg resolution. The azimuth is by pulse counting and a standard satellite (PACE) positioner. Adding an absolute encoder will be difficult on this mount. However, I will keep working on it. The septum plate feed is courtesy of DL4MEA and DL4HUP, who provided me with the kit of parts to build the feed. Return loss, isolation and circularity have all been measured as close to OK1DFC's claimed figures. The feed is mounted into a 'cage' that allows plenty of adjustment range to get the focus right and will ultimately allow me to substitute feeds for other bands. The preamp was just finished in time for the contest. Using the famous Martlesham Radio Society HP 8970 and HP346A head, the noise figure measured 0.37 dB and a gain at 24 dB. As the moon came into my view at 105 degs on Sunday afternoon, I started to hear lots of signals with HB9BBD, F2TU and G4CCH all easily identified. My weak signal CW ability is now strained to the limit and I need more practice to determine the other call signs. HB9BBD peaked about (559). I haven't measured sun noise yet, nor have I tried to optimize the feed position, so I expect several more dB improvement. Next comes the PA. I am on the look out for a suitable 200 W or larger PA. Bigger would be better, but also expensive. I also need to learn the lesson that 7.5' is not big enough! I am pleased with my initial results. Thanks to G3LQR for all the encouragement. I am sure I could hear his echoes at one stage, which bodes well for the future.

G4RGK: Dave was on 432 during the April SW. He QSO'd WB0GGM - good signal, DJ3FI, UA3PTW, RA3LE, OE3JPC and KU4F. His activity on Sunday was limited by high winds.

GM0OON: Iain iain.gm0onn@btopenworld.com has started construction of a 4 m dish for 23 cm EME. The hub (Al) is complete and the elevation mount is currently being machined from an Aluminum bar with a stainless steel sleeve. No forecast on this project yet, but I will hopefully have it up and running for 2004. Due to my poor QTH (tree cover), the dish must be portable for different positions in my garden. This is not an ideal solution but workable. I still have my 1.8 m (deep) dish with VE4MA/hybrid feed and 230 W and WDG preamp. [How about trying some JT44 skeds with the small dish?]

GW3XYW: Stuart gw3xyw@thersgb.net reports on his April EME activity -- I had quite an interesting time during the last SW on 10 GHz. Stations worked were G4NNS (M/M), partial CT1DMK (T/-), F2TU (M/M) and W5LUA (O/O). My initial total on 10 GHz now stands at #5. I was unable to be QRV on Sunday due to high winds. On 18th March I completed on 13 cm with N8OU (559/559). Tnx to G3LTF for setting up this sked.

HA5SHF: Csaba's (HA5BGL) <kiraly.csaba@ln.matav.hu> group was QRV on 1296 during the EWW EME Contest – We had limited time, but we were active on 23 cm. All QSOs were on random. Worked were HB9BBD, OH2AXH, HB9Q, G3LTF, OH2DG, SM3AKW, F6KHM for an initial (#), G4CCH, F2TU, OK1CA, OZ6OL, OZ4MM, K5GW #, HB9SV and ZS6AXT.

HB9BBD: Dominique had a fine time in the EWW Contest. He QSO'd on 1296 on 12 April at 1458 OZ6OL (559/579), 1502 OH2DG (589/589), 1524 F2TU (589/589), 1530 G4CCH (579/579), 1335 OK1CA (579/599), 1345 JH1EFA (419/559), 1407 PA3CSG (589/579), 1413 OE9ERC (589/599), 1420 JA6CZD (579/579), 1429 HA5SHF (529/579), 1438 OH2AXH (579/579), 1443 F6KHM (599/599), 1447 ZS6AXT (579/589), 1657 G3LTF (589/589), 1510 HB9Q (58/58) on SSB, 1521 HB9JAW (599/589) for initial #189, 1713 DL1YMK (579/559), 1720 SM3AKW (579/589), 1733 OZ9AAR (539/569), 1751 IK3COJ (559/569), 1802 IK2MMB (579/589), 1807 DK0ZAB (579/589), 1817 JA6AHB (579/579), 1832 DL8OBU (569/579), 1842 OZ4MM (589/589), 1847 G3LQR (579/579), 1910 HB9SV (599/599), 1922 OE5EYM (589/559), 1930 DF3RU (569/579), 1950 F5VHX (559/579) #190, 2025 N2UO (569/579), 2043 K5GW (589/599), 2125 K2UYH (589/589), 2130 K5JL (599/599), 2200 VE6TA (559/579), 2242 WA4NJP (559/559), 2246 W7SZ (579/579), 2308 W2UHI (589/589), 2327 WA6PY (569/579) and 2336 SM2CEW (579/579), and on 13 April at 1536 SM5CFS (559/579) #191, 1606 DJ9YW (579/569), 1736 DM3UH (579/599) #192, 1805 DL4MEA (579/569), 1810 SM0NKZ (559/579) #193 and 2233 N2IQ (589/599).

HB9JAW: Michel HB9JAW@Kaktus.ch made it on 1296 for the EWW Contest -- Just before the contest I finished improving my 1296 RX system. (Sun noise is still not where it should be). I worked on 11 April W5LUA (559/559) for an initial (#), DF4PV (559/569), K0YW (559/579) #, DF4PV (55/55) on SSB, and on the 12th G3LTF (559/569) #, OH2DG (559/559) #, JA6AHB (559/559) #, G4CCH (559/579), PA3CSG (569/569) #, DJ9YW (559/559) #, HB9BBD (589/599) # and (57/59) on SSB, F6KHM (57/57) # on SSB, F2TU (55/55) # on SSB, OK1CA (559/559) #, DF3RU (559/559) #, HB9SV (599/589) and (57/57) on SSB, OE9ERC (57/57) # on SSB, IK2MMB (569/579), OZ6OL (559/559), IK3COJ (559/559) #, G3LQR (559/559) #, SM3AKW (559/579) #, VE6TA (539/579) #, N2IQ (579/589) #, N2UO (539/549) #, K5JL (589/599) #, OZ4MM (579/579) #, K5GW (579/589) #, W2UHI (559/559) #, SM2CEW (559/569) #, HB9Q (589/559), DF4PV (579/579), WA4NJP (0/0) #, DL1YMK (449/549) #, and then I fell asleep – hi. Heard but not worked were K2UYH, F5VHX and K7XQ. On Sunday the 13th, I added ZS6AXT (559/569), SM5CFS (0/0) #. On Sunday night I returned to my station after work at about 2000. I called with some breaks, but was disappointed to make only 2 QSOs in over 2 hours. At 2300 I turned my station off and went to sleep. In all, I worked 32 QSOs in the contest with 27 initials. 23 cm is surely a very fascinating band. I still need to fix my 70 cm PA. I need some Ultem, Mica or Kapton (200 mm x 200 mm x 0.15 mm). Can anybody help me pse.

HB9Q: Dan hb9crq@hb9q.ch sends us news of his EWW 1296 Contest results -- During last weekend, we have been QRV for 11 hours on Saturday. We enjoyed the contest very much and managed to work 41 stations and 22 multipliers. All QSOs were on random. The calls were OH2DG, JA6CZD, F2TU, OK1CA, F6KHM, G3LTF, HA5SHF, ZS6AXT, HB9BBD, OZ4MM, JH1EFA for an initial (#), JA6AHB, SM3AKW, DF3RU, OH2AXH, DL1YMK, G4CCH, OZ6OL, F5VHX, DK0ZAB, IK2MMB, G3LQR, OZ9AAR #, IK3COJ, HB9SV, OE9ERC, DL8OBU, OE5EYM, N2UO, K5GW, K2UYH, DF4PV, K5JL, VE6TA, W2UHI, WA4NJP, HB9JAW, W7SZ, VE7BBG #, WA6PY and K7XQ #. This gives us 3 initials. F5VHX is not new and the same as ex F/G8MBI. Even though we had some problems with our TX (only between 100 and 200 W at the feed, we felt the station was performing well. We will try to continue to optimize our system in the coming weeks. We will keep you posted. For complete log details please see www.hb9q.ch. Also please do not forget to update your standings online at the Initial Data Base on our home page.

I5PPE 10 GHz Dish mount

I5PPE: Alex (IK5WJD) ikcsg@tin.it and Pietro (I5PPE) pipesa@tin.it report on their EWW Contest team effort on 10 GHz – At noon of Saturday 12 April, the WX seemed cloudy and ready to rain. About 15 minutes after the TWT warmed up and some CQs to test our echoes, lightning flashed very very close to us. The crack of thunder was terrible and terrific. The main electric power went out for about 20 minutes. When it returned, we founded a roasted 12 dc supply. This was a perfect beginning and in perfect coherence with Murphy's law. Then strong wind from west began, which set the dish swinging dangerously. Because nothing was being heard, we decided to rotate the dish face down to protect its surface. Finally the wind lowered and we were able to tracking the moon and heard strong signals from F1BLL. After a nice CW QSO, we also copied him on SSB with an impressive signal. We ended with 7 QSOs with F1BLL, G4NNS and IK2RTI (3 initial contacts) and F6KSX, OK1UWA, DL2LAC and F2TU (already contacted). Called but not worked were DL0EF and OK1KIR. During the afternoon and evening Sunday 13th, we heard nobody except for F6KSX.

K5RBB: Richard blockfranke@uams.edu is working on a High School Science Fair project that involves moonbounce. Richard is looking for an existing EME station that he can work with. He is located in Little Rock, AR and is hoping to find someone in driving distance. [I have already passed his email on to WD5AGO and K5JL.] His address is 141 El Dorado DR, Little Rock, AR 72212 and Cell Phone is 501-952-3274.

K7XQ: Jeff's <k7xq@elite.net> 23 cm contest results – I was on at my moonrise, 0000 till 0400 and worked K5JL, OZ4MM for initial #17, HB9Q #18, K5GW, G4CCH, F2TU and K0YW. CWNR were HB9JAW, OK1CA, N7AM, OE9ERC and OH2DG. Heard were W5LUA, DF4PV and bits and pieces of W9IIX.

KE2N: Ken KE2N@cs.com is QRV on 70 cm. During the April SW he worked KU4F, UA3PTW and DL9KR (very loud). He was limited by a TR relay problem (Transco solenoid acting up).

KI0LE: Bryce ki0le@monetbroadband.net has set for 432 EME on JT44 EME, but can be convinced to go on CW. He is now up to initial #4 with a QSO to K2UYH (12/14 dB). He worked his 1st CW EME with DL9KR for #3 and notes that he is building up a 40 m QRP rig to try and build his CW skills.

KJ7F: Terry terry@velocitus.net is looking for 70 cm JT44 skeds. He has 4 x 33FO yagis and 800 W. He completed with RA3LE in April for initial #54, but missed a JT44 sked with K2UYH due to high wind.

LU8EDR: Daniel lu8edr@softhome.net made some strange observations – While looking at sun noise on 12 April on 1296.000 in USB, I measured 20.5 dB several times. But the real surprise was at the same time on my PC screen with the Argo V1 132 program, I saw a carrier on 1600 Hz, 5 degs AZ to North from the Sun (25 degs Sun, 20 degs carrier) at the same elevation (43 degs) at 1440 Z more or less. This carrier displayed Doppler, and appeared and disappeared when I moved my dish. Is there a satellite on 1296? I am still not ready to TX as my new tubes are still not in my P.A.

LY2AAM: Oliver (DL1EJA) DL1EJA@yahoo.de is planning a dxpedition to Latvia on 70 cm EME. Operation will be from 1 to 5 June. (They will QRT at about 1000 on the last day to get everything packed for shipping.) The station will consist of 2 x 38 el (13 WL) M2 yagis, FT-847 with GS23B-PA (1 kW) and LNA by DJ9BV (0.43 dB NF). The locator is KO06. Although all details have not yet been finalized, they will probability TX on 432.045 and listen for sked stations on 432.050, and for random contacts on 432.055. If no signals are heard after 15 minutes in skeds, they will respond to random calls on .055. When skeds are complete, they will listen for calls on .050. K1RQG K1rqg@aol.com is arranging skeds. Contact Joe by email or preferably by the 20 m net. Feedback during the expedition can be obtained via 20 m and vhfnet. They are hoping that DK3WG will again assist with liaison via HF and Internet. Operators will be DF2EA, DH8BQA, DL1EJA, DL3BQA, DL5UH and DL5YYM. Not JT44 operation is presently being planned.

N2UO: Marc lu6dw@yahoo.com reports on his 1296 contest activity – Just days before the contest I discovered and fixed a noise problem that I suspected, but did not know existed. It had been present for a long time. I improved my receive sensitivity by 4 dB! This made a big difference, and now I can hear my echoes quite strong all the time. During the contest I worked F2TU, K5JL, W2UHI, G3LTF, F6KHM, K0YW, G4CCH, K5GW, K2UYH, N7AM, HB9Q, OH2DG, OE9ERC, HB9JAW, OZ4MM, DF3RU and OZ6OL. There were a lot of stations that I heard but never worked, mainly due to my limited operating time - (I had a ham visitor from Argentina over that weekend). In any case, I had a good time and look forward to working the contest again next year. I will certainly try to operate more time and stay up for the JA window.

N7AM: Jack jackriggs@attbi.com was on 1296 in April for the EWW Contest – I experimented during the contest with ways to improve my copy. I tried everything, many different headsets, with or without ear muffs, several type hearing aids, adjusting the audio levels, and audio band pass. Not real sure we learned anything from these tests to help my lousy hearing. I enjoyed the contest and working the guys and am looking forward to the next one. Here, we had to contend with windy condx and had to shut down several times when we could not continue. Saturday night we spent a lot of time late hoping for a ZL or JA, but heard nothing beyond our own echoes. Stations worked on 1296 during the contest were K5JL, F2TU, W2UHI, K5GW, OK1CA, G3LTF, G4CCH, F6KHM, K2UYH, WA6PY, K0YW, N2UO, WA4NJP, SM3KW, DL1YMK, OE9ERC and W5LUA for a total of 13. I'm looking forward to the next one.

OK1CA: Franta ok1ca@ges.cz sends his report from the second part of EWW EME Contest on 1296 – There was the bad weather on Friday. I had 20 cm of snow inside the dish, but that night and Saturday the WX was clear and quite. I tried a new PA with a GI7b that provided 250 W out. I had a problem with temperature stability. I finished operation on Sunday morning with a contest score of 40x23. Initials were VE6TA, DF3RU, HB9JAW, DL8OBU and W9IIX to bring me to #108. I heard N2UO, N2IQ and JH1EFA.

OZ9AAR: Carsten writes -- Yesterday I finished installing my feedhorn in my new 8 m dish, soldered some connectors, and mounted a 7/16 connector on my 7/8 TX able. After some hours of work, I thought, why not try to connect the cables to my transverter and see if there is at least some noise to be heard. I then realized that the moon was close to my work platform in azimuth, so I moved the dish to the moon. WOW, I heard a lot of signals! My IC756PRO II has a bandscope, and with 50 kHz span, I saw several "spikes", many stations were calling. I made a sequencer and decided to try and call some of the big guns. I worked HB9Q, HB9BBD, OZ4MM, F2TU and G4CCH. Also heard many stations including OZ6OL, IK1MMB, OH2DG, HB9SV and OE9ERC. I called a few of these, but only got QRZ back. This was all done using 7 W at the feedhorn! I tried to change quickly from TX to RX, and I did hear my own echoes very well. I'll be back. I have a dual 2C39 cavity from VE1ALQ. This is going to drive my TH327 cavity from HB9BBD, then echoes should improve!

OZ9AAR working on his new 8m dish

PA0BAT: Gerard gerard.geesink@wxs.nl is QRV on 70 cm EME – So far I did not join any moonnet or whatever it is called for making skeds. The QSOs I made were all on random -- I've only a small station consisting of 4 x 26BV, 0.28 dB NF LNA and 500 W PA. All the QSOs I have made thus far were on random, but I will respond to e-mail request for skeds. I'm also making preparations for 144 and 1296 EME as well.

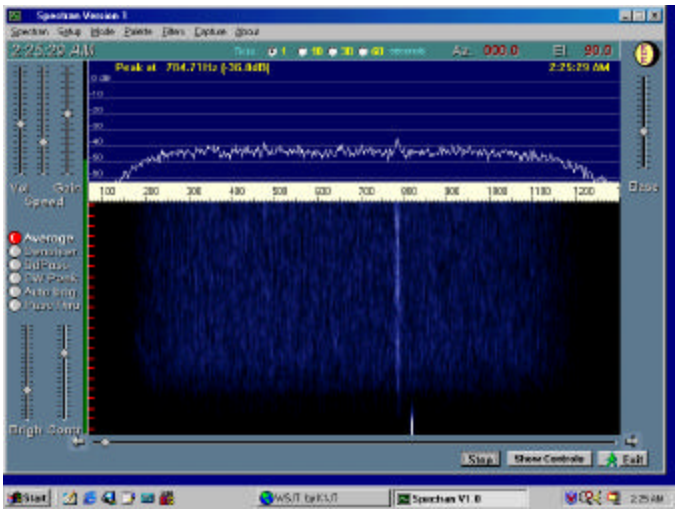
SM2BYA/SM3BYA: Gudmund sm2bya@telia.com writes – I was down at my SM3 QTH 2 weeks ago. The 432 array (8x 21 el yagis) was still delivering only 8 dB of sun noise, so started investigating. I found that my 1 kW Bird slug (the one I've been trusting the most) had gone badly non-linear at the low power end, indicating next to no reflected power. Several other slugs showed about 100 W reflected with 800 W going up the line. That translates to more than a 3:1 VSWR at the array. I don't know for how long this bad slug has fooled me, but I will be more careful from now on. I climbed the tower, opened the feed harness and checked each group of the 4 yagis separately. One group showed a perfect match, while the other seemed to have a dead short somewhere. The array was probably this bad already during the EWW Contest - everyone who worked SM3BYA then did effectively work a "two Yagi" station with a 3:1 VSWR at the preamp! The elevation readout pot had also failed. There was a bad windstorm in the area about a month ago. Maybe that caused both problems. No use taking any skeds with the array in its present condition. I can't repair it without lowering it to the ground, so I am unlikely to be QRV for the next

couple months. I will start digging the foundation for my new 7.5 m dish in June. Once that has gone up, these feed system problems should be a thing of the past. The JW/SM2BYA operation is still on, but the schedule keeps slipping due to my busy schedule over the summer. There are 3 important birthdays in the family that I really can't miss. Unfortunately they happen to coincide with the perigee weekends in Sept and Oct. The earliest opportunity seems to be the Nov ARRL Contest weekend, but that may collide with some radar operation, which will have higher priority.

VE7BBG: Cor ve7bbg@shaw.ca is QRV on 1296 with 120 W at the feed of a 7.5' dish. During the contest he found echoes were down between 3-4 dB from usual. He only worked HB9Q and OZ4MM. Stations such as F2TU easily worked before only came back with QRZ. After the contest, on 14 April, he worked K2UYH on JT44 with excellent signals.

WB0GGM: John was active on 432 during the April SW. He QSO'd G4RGK and OE3JPC, but heard nil from SM5IOT during skeds. John CWNR KU4F.

W2ETI: Paul, N6TX reports that the SETI League's W2ETI Moonbounce Beacon was returned to service in April, after a one-month outage, just in time for a calibration tests with the Arecibo and Jodrell Bank Radio Observatories. The beacon is on precisely on 1296.000. It transmits a carrier the first full minute of every 5 minute period, and identifies twice on CW during the beginning of the 2nd minute. Reception reports are solicited and will receive a hansom QSL in return. See http://www.setileague.org/eme/status.htm for more information.



W2ETI Moon beacon as observed at K2UYH

W4AD: Jack completed his first EME contacton 10 GHz during the EWW EME Contest with W5LUA. He is using a 12' dish with a 25 W TWTA. Jack reports that W5LUA was actually moving his S meter, but that he still needs to optimize his feed as he was marginal on TX.

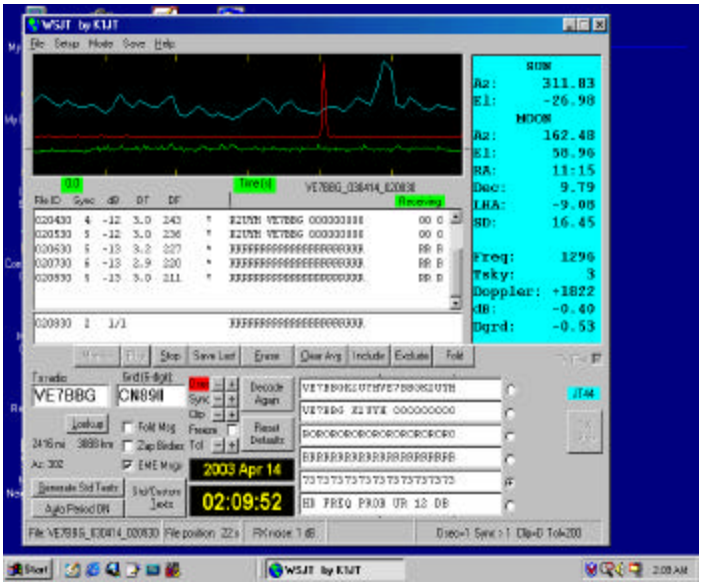
WA4NJP: Ray was active on 23 cm during the EWW Contest. He worked the first night N7AM and K2UYH and called N2UO. Ray did better the second day and ended with 15 QSOs and 3 initials (HB9JAW, DF3RU and N7AM).

WA6PY: Paul sends his log for the EWW EME Contest – I had very limited time but I was QRV for total 2.5 hours on 1296 in April leg of the contest and QSO'd on 12 April at 0149 F6KHM (569/449), 0153 K5JL (569/569), 0155 G3LTF (559/559), 0204 OK1CA (449/449), 0209 W2UHI (559/549), 0213 F2TU (569/559), 0219 G4CCH (569/539) 0224 K0YW (559/549), 0228 K2UYH (559/549), 0232 K5GW (569/569), 0239 N7AM (559/559), 0705 JA6AHB (O/O), 0717 VE6TA (O/O), 2315 OH2DG (559/539), 2321 HB9SV (579/569), 2327 HB9BBD (579/569), 2334 HB9Q (569/539), 2340 OZ4MM (569/559), 2344 OE9ERC (569/559) and 2350 ZS6AXT (539/559) for a total on 1296 of 2600 x 21 = 54,600 points. I am slowly working on 6 cm transverter, already have the 10 W TWTA and Chaparral feed horn. I have to finish transverter and build LNA. I'm also working on new 24 GHz transverter.

ZL1AK: Brent addis.zl1ka@xtra.co.nz is QRV on 1296 and interested in skeds -- I'd particularly like to try with EME stations in Spain, as that is my antipodes. My 23 cm station consists of a 6 m dish with f/d = 0.5 on a 3.8 ton Seacat Missile Launcher for a rotator with US Digital A2 absolute encoders. I am getting 20 dB sun noise and can just detect moon noise at about 0.5 dB - measured on an old TS 700 with AGC turned off with analog meter on output.

ZS6AXT: Ivo zs6axt@global.co.za reports on the EWW Contest – During the first pass of the moon on 12 April, I worked on 23 cm G4CCH, F6KHM, OH2DG, HB9BBD, G3LTF, OK1CA, HB9Q, OH2AXH, DF3RU, PA3CSG, SM3AKW, DK0ZAB, OE9ERC, F2TU, DL1YMK, JA6AHB, HB9SV, OZ4MM, OZ6OL, IK2MMB, G3LQR, IK3COJ, F5VHX for initial #188, DL8OBU, K5GW, K2UYH, N2IQ, K5JL, W2UHI, SM2CEW, W7SZ and WA6PY on the horizon. I missed K0YW, VE6TA, JA6CZD and OZ9AAR. On Sunday I added HA5SHF, DJ9YW, SM5CFS, OE5EYM, HB9JAW and DF4PV. I found activity very poor, especially from NA. Conditions were good with the exception of the first two hours on Saturday when I had a thunderstorm. WX was reasonable. On occasion the band sounded like the bottom of 20 m. Only one initial for me and one more QSO than last year. My score of 38 x 20 is not that good. I must still check the US states. Again, my moon window was considerably shorter than that for NA, thus I missed quite a few stations from the west.

ZL1AK's 6 m dish on Seacat mount



VE7BBG's 23 cm signal as seen on JT44

K2UYH: I tried a number of extra skeds on JT44. I ran twice with VK3FMD on 70 cm without success. During the first sked the center pin of 7/8" Heliax line burnt up. Everything was perfect on the second, but I still did not copy Charlie. He copied me near solid. I did have a FB JT44 70 cm QSO with DF4UE on 5 April for initial #659. John was easy copy in the speaker and virtually 100% copy on JT44 at -11 dB. He reported I was peaking at -16 dB. I have also listened on .044 for CQs, but heard nil. On 11/12 April I started operation on 70 cm, but had nil results with all my skeds. S53J and I were out of phase and transmitted during the same periods. PA0BAT and KE2N missed their skeds and

were not on. SM5IOT had system troubles and cancelled before hand. I had already worked DF4UE. I did QSO on random at 2153 OE9ERC (559/559). I switched over to 1296 at about 0100 and found conditions and activity good. I QSO'd at 0101 G3LTF (559/559), 0110 OK1CA (559/559), 0116 G4CCH (569/579), 0123 F6KHM (57/54) on SSB, 0128 K0YW (55/55) on SSB, 0137 W2UHI (559/559), 0144 F2TU (569/569), 0201 N2AM (559/569), 0206 K5JL (579/579), 0208 W5LUA (559/569), 0212 K5GW (579/579), 0228 WA6PY (549/559), 0423 N2UO (559/559), 0444 WA4NJP (549/559), 0500 nil VE7BBG, 0550 ZL1KA (449/O) for initial #209, 0625 JA6AHB (549/559) and 0645 QRZ – just could not pull the call out of my ground noise in time. The next day (13 April) I had to QRT at 1300 to go to WA2LTM's surprise 60th birthday party. Worked were at 2112 HB9Q (579/579), 2117 DF3RU (549/559), 2124 HB9BBD (589/579), 2133 ZS6AXT (559/579), 2138 OE9ERC (579/569), 2150 OZ4MM (589/589), 2153 OZ6OL (569/569), 2156 OH2DG (569/569) and 2201 DL1DMK (559/559). After the party I did not have energy to make it on for the setting moon in the wee hours. The next day I had a business meeting that prevented me making the end of the contest. I was QRV after the contest and caught (14 April) on 1296 at 0150 DF4PV (57/56) on SSB and 0200 VE7BBG (12 dB/-9 dB) on JT44 – very FB QSO. I then switched to 70 cm for more JT44 skeds at 0300 nil KF7J – not on due to wind, 0330 KI0LE (-13 dB/O) #660 and 0630 nil VK3FMD (-/-16 dB).

NETNEWS BY G4RGK (BASED ON K1RQG's NETNOTES): WD5AGO has new PA going on 23 cm, but has made no progress on 5.7 GHz. **K5JL** worked during April on 23 cm VE6TA and more than a couple dozen stations during the EWW Contest. **AD6FP** is working towards 47 GHz EME. He has 30 W on TX to 6' offset dish. **K5WXN** has all his 70 cm stuff down and is preparing to depart for Alaska. **9H1PA** has 2 x 26 el 8.5 lambda BVyagis ready for 70 cm EME. **K6DV** was hearing on 1296 during the EWW Contest, but had problems with his PA. **W2UHI** worked 28 stations on 23 cm during the EWW Contest. **VE6TA** was on 23 cm for a few hours during the contest. Grant now has 500 W from his new PA. **K0YW** worked 23 in the EWW Contest including JA6AHB. **WA8RJF** is getting ready for 23 cm EME. **DL9KR** was active in April on 432 and added initials with DF9RJ and KI0LE to bring hin to #776. Jan heard VK4AFL with big signal (579) and worked 5 stations including KU4F. **W5LUA** did not spend much time on 23 cm during EWW Contest, but did work on 10 GHz W4AD and GW3XYW on 10 GHz for new ones. **W7SZ** was on 23 cm during the contest and made 12 contacts. He heard but did not work W5LUA and N7AM. **W9IIX** worked 7 stations on 23 cm during the EWW Contest including an initial with OK1CA. He heard about 15 stations. **DK3WG** was not on 70 cm in April. **RA3LE** had five QSOs in April on 70 cm including an initial with KJ7F (O/O). **CT1DMK** was on 10 GHz during the contest weekend and worked 4 stations. Luiz reports both bad WX and bad condx. He is available for 5.7 GHz and 10 GHz skeds. **GM4PLM** has picked up a 16' dish. **K5GW** reports signals on 23 cm were down 2 or 3 dB the 2nd night of the EWW contest compared to the 1st.

FOR SALE: HB9JAW needs dielectric sheets – see his report. **OK1DFC** ok1dfc@tesmail.cz has Septum Circular Polarizer feeds available for 23 cm and 13 cm. Zdenek will have very soon also 9.6 and 3 cm feeds available. **DL1EJA** DL1EJA@yahoo.de needs a 38 el M2 13 WL yagi for 70 cm for his YL dxpedition activity. Any info on buying such a yagi is most welcome. Tel is +49-2824-7508. **W6WE** w6we@charter.net has 4 x 432-13WLA yagis with power divider and 5' LMR400 phasing harness for sale for $US700. (Phasing lines and power divider attach near driven element, not at center of H frame.) He also has a 14' dia Aluminum dish ((splits in half, 1/4" holes), 0.3 f/d, good to X-band for sale cheap! But all items must be picked up! (Mike Goshay, 636 Printz Rd, Arroyo Grande, CA 93420; tel 805-489-8300). **W1ZX's** estate - the following equipment is still available: Yaesu FT-736R (50 & 1296 modules) for $US1,200; FT-736R (1296 module)$US1,000; Kenwood TS-870 for $US1,000 and TS-870 for $US900; Yaesu FT-900 for $US650 and Drake TR-7 with PS-7 mic and speaker for $US650. Contact Joe at k1rqg@aol.com or Bryant at bamank@earthlink.net. **W9IIX** is looking for a 23 cm module for his FT-736R. **W2DRZ** has new dish control/tracking board available. Check Tom's website at http://mywebpages.comcast.net/russk2t/Drz/index.htm. The board is priced at $US162 in kit form.

ARRL Operating Awards and JT-44 by W5ZN, Joel, ARRL First Vice President: During the past several months, there has been considerable discussion about ARRL operating awards and how they apply to EME contacts. Specifically, how do new modes like JT-44 factor in to the recognition of operating achievement. Ever since the inception of the WAS and DXCC programs, contacts have been accepted for all modes of operation. As time progressed and radio amateurs achieved award levels with specific modes, interest was tweaked to recognize those specific achievements. Thus the creation of specific mode awards, i.e. CW DXCC, Phone WAS, RTTY DXCC, etc., with the original award becoming known as the mixed award to include all operating modes. New operating modes are not only healthy, but imperative for the amateur radio service. Without continuing innovation, we would still be using modes no longer in use even in amateur radio, but more importantly, we would be extinct. At the heart of the most recent debate is how to properly recognize someone for years of hard work, discipline and dedication toward a specific goal when new modes, hardware, or software become available and make the task a little easier. It is our sincere desire that you would embrace new technologies, for after all, that is what made amateur radio what it is today! Radio amateurs that are attracted into a new operating arena like EME because of something new like JT-44 are in effect novices to EME activity in general, just as I was when I first became interested in EME many years ago before there was ever a JT-44, DSP software, or even a preamp with a noise figure like we see today. I was welcomed by a long list of old timers. They were my Elmers. I was able to learn all the things required to be successful on EME and it has been the most enjoyable and rewarding thing I've been involved in as a radio amateur. The hard work and dedication of those who have spent countless hours in pursuit of an operating achievement should be recognized for their effort, however, our wish is that new modes and technologies would be embraced as they are developed. The operating award possibilities for recognition are quite numerous. If someone chooses to reach a particular level on a specific mode like CW, for example, then an operating award can be issued for such. As far as the Mixed awards are concerned, the League will continue the long standing tradition of the mixed award by including all available operating modes, including JT-44, in that category.

FINAL: The ARRL is about to set the dates for the 2003 ARRL International EME Contest. 18/19 Oct and 15/16 Nov are being proposed by VE7BQN. These are the proposed SWs – see the Dec NL, and offer good moon conditions coupled with high declination. Lionel also writes that they do not conflict with and European terrestrial contest. It thus seems very likely that these will be the date for the contest. If you would like to express your view on the contest dates write to w5zn@arrl.org.

There are only a few skeds this months. I'm not sure why. Please get you skeds request into Joe, K1RQG. Updates of the skeds list will be posted on the W6/PA0ZN EME Website at <http://www.nitehawk.com/rasmit/em70cm.html>.

Thanks to W1GHZ for the Septum Feed Technical material. We will have more on these feeds next month.

Please keep the reports and technical info coming! This was a difficult month for me, but the NL is complete. I hope to be hearing you off the moon soon. 73, Al – K2UYH

Analysis of the OK1DFC Septum Feed

Paul Wade, W1GHZ ©2003

The septum feed[1] was described by Zdenek, OK1DFC, at the 10th International EME Conference 2002 in Prague. On-the-air results were promising, but, like any new antenna, there were questions as to how well it really works. Computer simulations suggest that this feed should work well, and also suggest some variations to allow use over a range of dish ***f*/D**. The septum polarizer may also be used to generate circular polarization in other feedhorns.

Description

The septum feed as described by OK1DFC is an unflared square horn, or simply a square waveguide, with an internal stepped septum to generate circular polarization. Figure 1 is a cartoon of a septum feed with one wall cut away. The horn is excited by inputs on either side of the septum, with the two sides exciting opposite senses of circular polarization. For EME, this provides separate transmit and receive ports of opposite polarization. The excitation may come from two rectangular waveguides, each matching the dimensions of one-half of the square horn, or from a perpendicular probe on each side of the septum acting as an integral transition from coax to the waveguide. The two methods should provide identical results provided that the waveguide section before the septum is long enough to suppress any spurious modes.

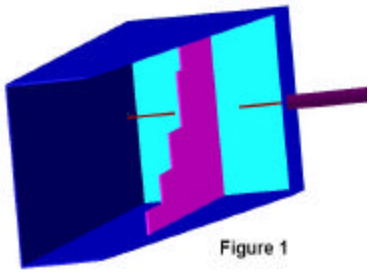


Figure 1

The radiating element, at the aperture, is simply a square horn. Rotated 45 degrees, it is identical to a diagonal horn[2]; if the diagonal horn is excited with circular polarization, then the radiated pattern should be identical. N7ART has shown[3] the diagonal horn to be a good feed, so we might expect the septum feed to be also. The version described by N7ART used phased crossed dipoles to generate circular polarization. The septum could be a better way to generate circular polarization.

The septum is a bit more complicated. A circularly polarized wave entering the aperture may be considered to have two polarization components with a 90º phase difference, one parallel to the septum and one perpendicular. The parallel component is divided equally by the septum and passes to the two rectangular input waveguides. The cutoff frequency for the perpendicular component is changed by the septum, so that the wavelength for the perpendicular component is shorter. Thus, the electrical length of the septum is longer for the perpendicular component than for the parallel component; if the difference in length is ¼ λ, or 90°, then the horizontal and vertical components arrive in phase at the input. The components add together on one side and cancel on the other, depending on the sense of circular polarization, so that the two ports are isolated from each other. In order to achieve the difference in electrical lengths in a reasonable physical distance, the septum polarizer operates near the cutoff wavelength of the waveguides.

Simulations

A septum feed for 1296 MHz with dimensions specified by OK1DFC was simulated using Ansoft **HFSS** software[4]. The calculated radiation patterns in Figure 2 show the broad illumination expected of a small horn. Like other open waveguide feeds, the rear lobes are relatively large, only about 12 dB down, reducing the calculated efficiency to about 68% with best ***f*/D** around 0.35 to 0.4. Patterns for right and left hand circular polarization are pretty much identical. Patterns were calculated for both probe excitation and rectangular waveguide excitation; they were very similar, so the distance from the probe to the septum is adequate.

The circularly polarized pattern of the septum feed, shown in 3D in Figure 3, shows sidelobes on the four corners like the diagonal horn, generated as the polarization vector passes through horizontal and vertical polarization in the square horn. The sidelobes on the corners reduce the calculated efficiency by perhaps four percentage points compared to a calculation using only the traditional horizontal and vertical pattern cuts. The circular polarization is quite good, with cross polarization about 21 dB down, and the pattern circularity is good. Isolation between the two ports is about 24 dB at 1296 MHz, with reasonable bandwidth, showing good isolation from at least 1.2 to 1.4 GHz. Note that reflection from the parabolic reflector reverses the circular polarization, so that the reflection coming back into the horn will reduce the isolation.

While the calculated efficiency of this feed is not as high as some, the better ones have a larger blockage shadow, so the septum feed may be the best performer on a small dish where circular polarization is required.

Other *f*/D dishes

The diagonal horn may be tailored to illuminate a various ***f*/D** by varying the dimensions of the diagonal section, or by adding a flared section for larger ***f*/D**. Since the operation of the septum in generating circular polarization depends on the guide dimensions being close to the cutoff wavelength, the square cross-section is fixed at 0.63λ for a given operating frequency. However, a flare section may be added to increase the aperture size to optimize the horn for any larger ***f*/D**, so that the septum feed may be used for any dish with ***f*/D** > 0.3. The flare section is similar to a rectangular waveguide horn, except that it should maintain a square cross-section with a gentle taper to prevent excitation of unwanted modes.

I first tried a adding a flare section with an aperture 1.4λ square and a flare angle of 30° (15° halfangle on each side of the septum), since this size diagonal horn with linear polarization is a good feed for an offset dish with an equivalent ***f*/D** around 0.7. With the septum feed generating circular polarization, the calculated efficiency in Figure 4 is high with best ***f*/D** is around 0.7 to 0.85, suitable for many offset dishes. This horn also had high rear sidelobes on the corners, so that the 3D pattern in Figure 5 looks like a rocket with fins. An intermediate size flare, with an aperture 1.1λ square, produces the radiation patterns with high calculated efficiency at intermediate ***f*/D**, best around 0.5 to 0.6, and less pronounced corner lobes.

Both flared septum horns show good isolation and cross-polarization. Since horn beamwidth is inversely related to aperture size, we can choose an appropriate aperture for the flare for any ***f*/D** by interpolating between the results for the three sizes above, 0.63λ square, 1.1λ square, and 1.4λ square. For smaller apertures, the flare angle should be small so that the flare length is reasonably long.

Summary

The septum feeds are impressive — a feedhorn with good circular polarization performance with no adjustments and no phasing losses. The simple square cross-section described by OK1DFC is ideal for low blockage on small deep dishes, while a choke may be added for better performance on larger dishes. A flare section to increase the aperture will better illuminate shallow and offset dishes. The septum polarizer can also be used in cylindrical horns like the VE4MA feed. More information is available on the OK1DFC (www.qsl.net/ok1dfc) and W1GHZ (www.w1ghz.org) web pages.

References

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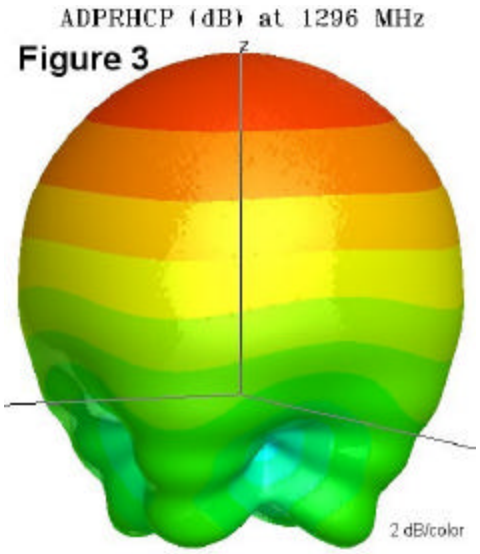
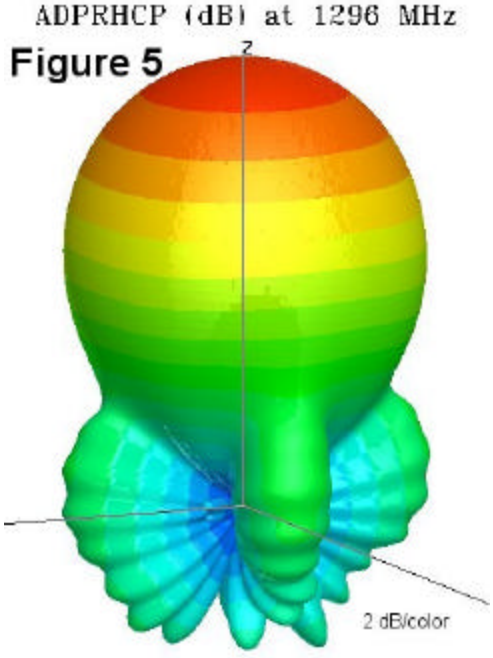
4. www.ansoft.com





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May Skeds

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10 May
Time     432.040
1400z  JA8ERE-G3LTF
1430z  DL7UDA-G3LTF
2230z  K6JEY -DK3WG
2300z  K6JEY -G3LTF
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